

The invention claimed is:

1. A steering system for a motor vehicle, comprising:

a steering shaft having a first portion and a second portion, the first portion of the steering shaft adapted to receive an input from an operator;

5 a rotational coupler connecting the first portion of the steering shaft to the second portion of the steering shaft, the rotational coupler allowing the first portion of the steering shaft to rotate independently of the second portion of the steering shaft when a rotational torque that exceeds a maximum torque value is exerted on the second portion of the steering shaft;

10 at least one wheel that pivots to define a steering angle, the steering angle being determined, at least in part, by the input to the steering shaft by the operator, the first portion of the steering shaft and the steering angle having a given original alignment therebetween;

15 a motor operatively connected to the wheel, the steering angle being determined, at least in part, by an input from the motor; and

a controller operatively connected to the motor and adjusting the input of the motor to the steering angle, and realigning the steering angle with the first portion of the steering shaft to the original alignment therebetween subsequent to a torque that exceeds the maximum torque value being exerted on the second portion causing the second
20 portion of the steering shaft to rotate independently of the first portion of the steering shaft.

2. The steering system of claim 1, wherein;
the rotational coupler includes a clutch.

3. The steering system of claim 2, wherein:
the clutch includes a predetermined maximum torque set point above which a first portion of the clutch is able to rotate independently of a second portion of the clutch.

4. The steering system of claim 3, further including:

at least one sensor in operable communication with the controller that monitors the alignment between the steering shaft and the steering angle.

5. The steering system of claim 4, further including:

at least one sensor in operable communication with the controller that monitors the application of a torque being applied to the first portion of the steering shaft, thereby allowing for disengagement of the clutch and locking the rotation of the first portion of the steering shaft with the second portion of the steering shaft when the associated vehicle is not running.

6. The steering system of claim 1, further including:

at least one sensor in operable communication with the controller that monitors the alignment between the steering shaft and the steering angle.

7. The steering system of claim 1, further including:

at least one sensor in operable communication with the controller that monitors the application of a torque being applied to the first portion of the steering shaft, thereby allowing for disengagement of the clutch and locking the rotation of the first portion of the steering shaft with the second portion of the steering shaft when the associated vehicle is not running.

8. A steering system for a motor vehicle, comprising:

a steering shaft adapted to receive an input from an operator;

at least one wheel that pivots to define a steering angle, the steering angle being determined, at least in part, by the input to the steering shaft by the operator, the steering shaft and the steering angle having a given original alignment therebetween;

at least one sensor for sensing the exertion of a force on a component of the steering system that exceeds a maximum set value;

a motor operatively connected to the wheel, the steering angle being defined, at least in part, by an input from the motor; and

an actuator operatively connected to the motor and in operable communication with the sensor, wherein the actuator reduces the amount of the force exerted on the component as transmitted to the steering shaft by allowing a misalignment of the steering shaft and the steering angle.

9. The steering system of claim 8, wherein:

the actuator realigns the steering shaft and the steering angle to the original alignment over a finite period of time.

10. The steering system of claim 9, further including:

at least one sensor in operable communication with the actuator that monitors the alignment between the steering shaft and the steering angle.

11. The steering system of claim 10, further including:

at least one sensor in operable communication with the actuator that monitors the application of a torque being applied the steering shaft.

12. The steering system of claim 10, further including:

at least one sensor in operable communication with the actuator and that monitors the velocity of the vehicle, wherein the actuator prevents a misalignment between the steering shaft and the steering angle when the velocity of the vehicle is zero.

13. The steering system of claim 8, further including:

at least one sensor in operable communication with the actuator that monitors the alignment between the steering shaft and the steering angle.

14. The steering system of claim 8, further including:
at least one sensor in operable communication with the actuator that monitors the application of a torque being applied to the steering shaft, and wherein the actuator prevents a misalignment between the steering shaft and the steering angle when the vehicle is parked.
15. The steering system of claim 8, further including:
at least one sensor in operable communication with the actuator and that monitors the velocity of the vehicle, wherein the actuator prevents a misalignment between the steering shaft and the steering angle when the velocity of the vehicle is zero.
16. The steering system of claim 8, wherein:
the sensor for sensing the exertion of a force to the wheel senses the stress exerted on a component of the steering system.
17. The steering system of claim 8, wherein:
the component of the vehicle includes a steering link.
18. A method of dampening the forces transmitted to a steering wheel of a vehicle when a steerable wheel of the vehicle collides with an obstacle, comprising the steps of:
steering a vehicle via a steering wheel operably connected to a steerable wheel, the steering wheel defining an input angle;
monitoring the rate of change of a steering angle as defined by the steerable wheel, the ratio of the input angle to the steering angle defining a steering ratio; and
reducing an amount of torque transmitted to the steering wheel from the steerable wheel when the rate of change of the steering angle exceeds a maximum rate by adjusting the steering ratio.
19. The method of claim 18, further including:
monitoring the original alignment between the steering wheel and the steerable wheel; and

realigning the steering wheel with the steerable wheel to the original alignment over a finite period of time via an active steering actuator.

20. The method of claim 19, wherein:

the step of monitoring the rate of change of the steering angle includes monitoring the stress exerted on a component in a vehicle steering system.